APPENDIX G
BATTERY CHARGING AND STORAGE OPERATIONS

PERFORMANCE OBJECTIVES:

- To insure that field batteries are properly charged and maintained.
- To insure that field battery charging is conducted in a safe and efficient manner.
- To provide a means for keeping an inventory of the status and number of field batteries on hand.

G.1 Receiving Batteries from the Field

Upon return from the field, batteries may or may not require maintenance and charging. The following procedure will be used to process incoming batteries.

CAUTION
DANGER OF EXPLODING BATTERIES

Batteries generate explosive gasses. Keep sparks, flames, burning cigarettes, cigars, or other ignition sources away at all times. Always shield eyes when working near batteries. Charge batteries only in well ventilated areas. Wear protective covering when working around batteries.

DANGER OF ACID BURNS

Always wear a face shield, protective coat, and rubber gloves when handling batteries. In case of skin contact with acid, immediately wash affected area for 15 minutes, using safety shower, eye wash, or sink as required. Seek medical attention as soon as possible. Notify the designated Safety Officer or management in the event of injury.

Procedure

Only designated persons are allowed entry into the battery charging building.

1. Check batteries for proper electrolyte level; if necessary, use battery filler to add tap water until levels in each cell are mid-way between the two level marks on the case. Insure that cell filler cap vents are clear. Replace filler caps immediately after filling.

2. Check battery terminals for cleanliness, and clean with wire brush if necessary.

3. Check batteries with load tester. Batteries which register in the green arc can be placed back in a battery box and stored in the "Charged Battery Area". Batteries which register below the green arc are to be removed from the battery box and stored in the "Discharged Battery Area". Empty battery boxes are to be stored beside the sink in the battery building using care not to block access to the safety shower.

G.2 Charging Batteries

Battery charging equipment is to be operated only by trained personnel who are familiar with these procedures. If at any time personnel are not absolutely sure of what to do, work should stop immediately and assistance should be sought. NOTE: Charger will not operate on less than two batteries.

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DANGER OF ELECTRICAL SHOCK

Never touch output leads while charger switch is on. Charger's maximum output is 280 volts at 9.5 amps.

DANGER OF ACID BURNS

Always wear face shield, protective coat, and rubber gloves when handling batteries. In case of skin contact with acid, immediately wash affected area for 15 minutes, using safety shower, eye wash, or sink as required. Seek medical attention as soon as possible. Notify the designated Safety Officer or management in the event of any injury.

Procedure

1. Insure that the 240 volt power supply box is locked in the "OFF" position.

2. Insure that the Charger Power Switch is in the "OFF" position.

3. Insure that the Charger Control Knob is set at "0".

4. Inspect all terminal clips for broken insulation and proper connection.

5. Clean all terminal clips with a wire brush.

6. Place the batteries in the charger bench so that the battery numbers are visible from the front and that the battery terminals are to the right when facing the bench. In this configuration, the positive terminals of all batteries will be to the front of the charging bench.

7. Connect the terminal clips securely to the battery terminals. Dirty terminal clips, dirty battery terminals, or loose connections will result in dangerous arching when the charger is turned on.

8. Insure that the charger's positive lead is attached to the positive terminal of the battery on the right hand facing end of the bench and that the charger's negative lead is attached to the negative terminal of the battery on the left hand facing end of the bench.

9. Remove all battery cell filler caps and store them in the box on the battery bench. Insure that the battery electrolyte level is between fill lines. If low, add tap water with the battery filler. If high, use battery filler to remove the excess electrolyte and dispose of it in the carboy labeled "Battery Acid".

10. Unlock the 240 volt power supply box and place lock on top of the box. Do not place lock back in the lock-out holes for storage as this will prevent a rapid turn off of the system in an emergency.

11. Place the 240 volt power supply box switch in the "ON" position.

12. Set the charger's timer as follows:

    For 2-3 batteries, set timer to 3 hours.
    For 4-7 batteries, set timer to 6 hours.
    For 8-11 batteries, set timer to 9 hours.
    For 12-18 batteries, set timer to 12 hours.

    Never operate the charger with the timer in "Hold" position.

13. Recheck the charger's control knob to insure it is on "0", and then place the charger's power switch to "ON".

14. SLOWLY increase the charger's control knob until a reading of between 7 and 8 amps is obtained on the amp meter.

WARNING

Never exceed a reading of more than 8 amps output from the charger.

Always advance the control knob slowly. In the event of a bad contact, arching of the charge current will occur and can result in an excessive flow of current to the batteries.

15. Observe the batteries for a few minutes to insure that none are boiling over.

G.3 Post-Charging

After batteries have charged for the amount of time set on the charger, the following procedure will be used to shut-down the charger and to remove and store charged batteries.

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DANGER OF ELECTRICAL SHOCK

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DANGER OF ACID BURNS

Always wear face shield, protective coat, and rubber gloves when handling batteries. In case of skin contact with acid, immediately wash affected area for 15 minutes, using safety shower, eye wash, or sink as required. Seek medical attention as soon as possible. Notify the designated Safety Officer or management in the event of any injury.

Procedure

1. Turn charger's control knob to "0".

2. Place charger's power switch in the "OFF" position.

3. Place the 240 volt power supply box switch in the "OFF" position and lock out the switch.

4. Replace all battery cell filler caps.

5. Disconnect all terminal clips.

6. Check all batteries with the load tester. Any batteries not indicating in the green arc, or slightly above will be red-tagged and stored in the "Discharged Battery Area". Those batteries indicating a sufficient charge on the load tester are to be placed in a battery box and stored in the "Charged Battery Area".

7. Record the status of all batteries removed from the bench in the "Battery Log Book".

G.4 Maintenance

During the first week of each month, the following maintenance procedures will be performed at the battery building. The individual performing the maintenance will complete a maintenance report and submit it to the designated Safety Officer.

Procedure

1. Sweep floor

2. Empty trash can

3. Check battery acid carboy. If more than half full, note on the maintenance report.

4. Check that both fire extinguisher gauges indicate in the green arc. Date and initial the inspection card attached to each fire extinguisher.

5. Check contents of the acid spill kit. If contents have been depleted, note on the maintenance report.

6. Check contents of the first aid kit. If contents have been depleted, note on the maintenance report.

7. Check operation of safety shower and eye wash.

8. Check operation of ventilation fan.

9. Check all batteries in the "Charged Battery Area" with the load tester. Any batteries testing below the green arc of the load tester should be removed from their battery box, red-tagged with the notation "Failed Monthly Check" and date of check, and placed in the "Discharged Battery Area".

FIGURE G.1
BATTERY LOG

BATTERY NUMBER	DATE CHARGED	CHARGE YES/NO	INIT

BATTERY NUMBER	DATE CHARGED	CHARGE YES/NO	INIT

FIGURE G.2
BATTERY BUILDING
MAINTENANCE REPORT

DATE:_____

			COMMENTS
1.	Floor Clean (Y/N)	_____	_____
2.	Trash Can Empty (Y/N)	_____	_____
3.	Carboy Under Half Full (Y/N)	_____	_____
4.	Fire Extinguishers OK (Y/N)	_____	_____
5.	Acid Spill Kit OK (Y/N)	_____	_____
6.	First Aid Kit OK (Y/N)	_____	_____
7.	Safety Shower/Eye Wash OK (Y/N)	_____	_____
8.	Ventilation Fan OK (Y/N)	_____	_____
9.	Charged Battery Status Enter # In Stock	_____	_____

SIGNED:_____

NOTE: SEND COMPLETED REPORT TO BRANCH SAFETY OFFICER